

Figure 1

1. bus being protected (one of three phases shown)
2. feeder into bus (one of three phases shown)
3. current transformer set (one of three phases shown)
4. connection from current transformer to protective relay
(one of three phases shown)
5. protective relay
6. trip signal decision

AT EACH TIME STEP...

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SENSE THE PHASE A CURRENT FROM
EVERY LINE CONNECTED TO THE BUS

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CALCULATE
 I_0 = PHASOR SUM OF ALL PHASE A CURRENTS, and
 I_r = MAGNITUDE SUM OF ALL PHASE A CURRENTS,
DIVIDED BY TWO.

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CALCULATE
THE DERIVATIVE OF I_0 (call this dI_0), and
THE DERIVATIVE OF I_r (call this dI_r).
KEEP ONE CYCLE OF INFORMATION.

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CALCULATE
The SECOND HARMONIC PHASOR
of each of dI_0 (call this dI_02), and
of dI_r (call this dI_r2).

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CALCULATE
The PHASE by which
 dI_r2 leads dI_02 (call this Ph).

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IF $Ph > X$, GENERATE A "BLOCK TRIPPING SIGNAL",
IF $Ph < X$, DONOT GENERATE A "BLOCK TRIPPING SIGNAL",
WHERE "X" IS A SELECTED PRESET PHASE VLAUE

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ISSUE A TRIP SIGNAL IF ABOVE THE
 I_0 VERSUS I_r BUS DIFFERENTIAL CHARACTERISTIC CURVE,
AND NO "BLOCK TRIPPING" SIGNAL IS PRESENT

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TO PREVENT LATE SATURATION FALSE TRIPPING:
CHECK FOR A SIGNAL IN THE "BLOCK AND HOLD" REGION.
IF PRESENT, GENERATE AND HOLD A BLOCKING SIGNAL
UNTIL THE SETTING "MAXIMUM BLOCK TIME" IS EXCEEDED.

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Figure 2

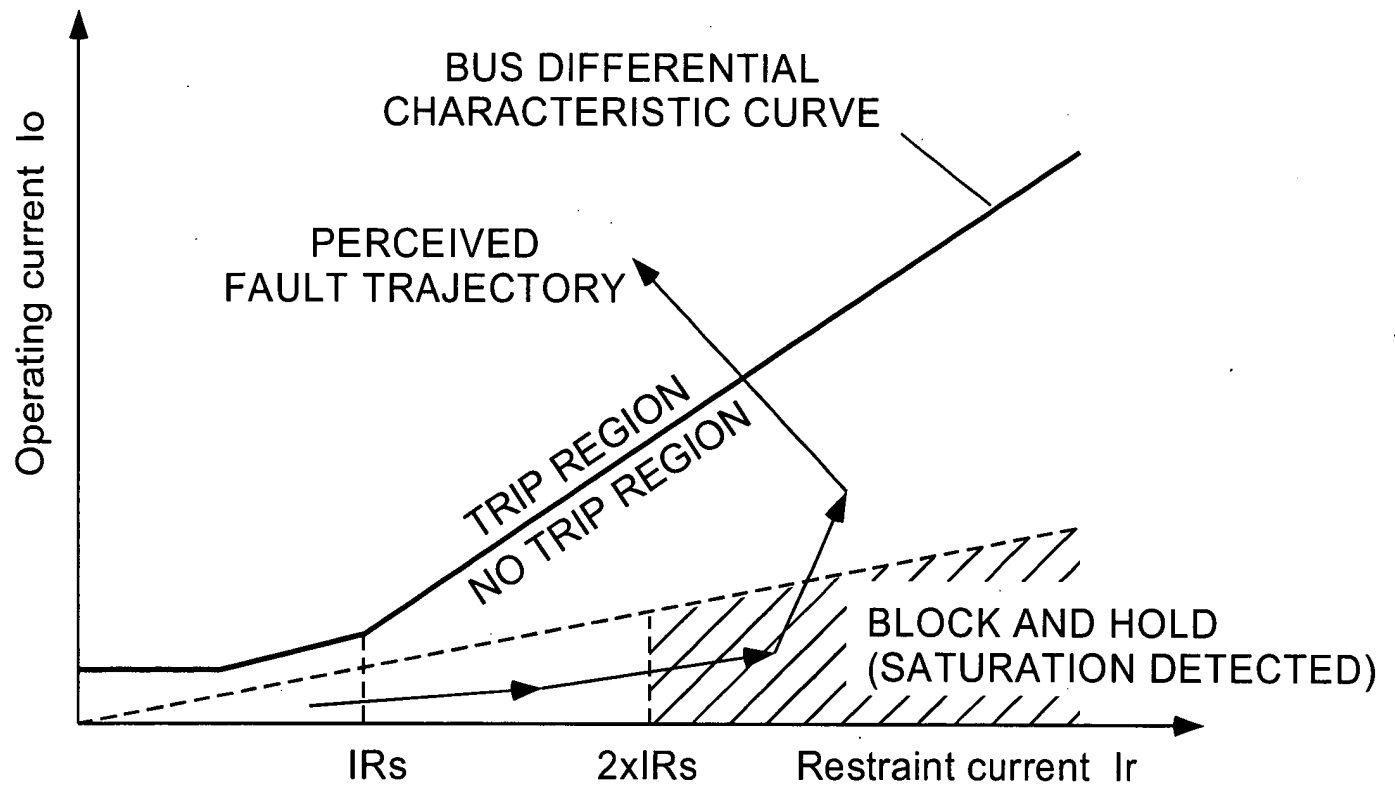


Figure 3